Your Photos Have Been Framed

Turn A Laptop Into Your Home's Most Treasured Computer

As you walk down the hall in my house, you will see a nice framed photo sitting on a table. If you walk by the table again later, you will notice that a different photo graces that very same frame. On closer inspection you may observe that the photograph is actually an LCD screen. Hidden inside the frame is an old laptop that's loaded with hundreds of pictures that change hourly.

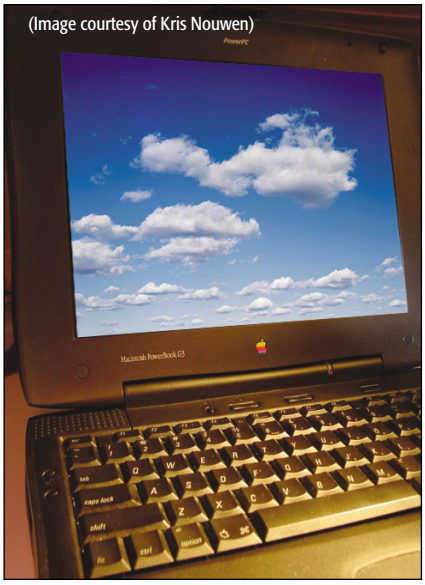
The frame is a great conversation piece and a wonderful way to exhibit digital photos that might otherwise be stuck in a photo album or buried in photo organization software. A few dollars and a few hours of effort was all it took to change the old laptop into a digital picture frame.

The project started when someone on the Freecycle (www.freecycle.org) mailing list in my area was giving away a PowerBook G3. Freecycle is a wonderful resource made up of thousands of regional mailing lists; it lets people in a geographic area give away free an eclectic mix of stuff.

As any self-respecting geek would, I immediately accepted the laptop without giving much thought as to what I would actually do with the machine. Once I received the PowerBook, I discovered that the battery didn't work, which is a common problem in older laptops. Also, this particular model couldn't run Mac OS X, which didn't make it ideal for using for daily work. I considered some interesting uses for the old machine before remembering seeing examples of digital picture frames on the Web. I decided to build one myself.

Although this project is built from a PowerBook, there's no reason you can't use a laptop running Windows or Linux to build a similar digital frame. If you were to build this project a dozen times using a dozen different laptops, the procedure would be unique each time. There's no cookie-cutter system to follow and no right or wrong way to do it. In addition, as you disassemble and reassemble the computer, you'll have to figure out which components are necessary and how to make them fit into their new case, the frame.

To start with, you will need the proper screwdrivers in order to open the machine (jeweler's screwdrivers and a set of TORX drivers should do the job), a power drill, and a shadow box frame, which is a frame that is two to three inches deep that's intended for showing off small curios.



Before it was a homemade digital photo frame, it was a PowerBook G3 notebook.

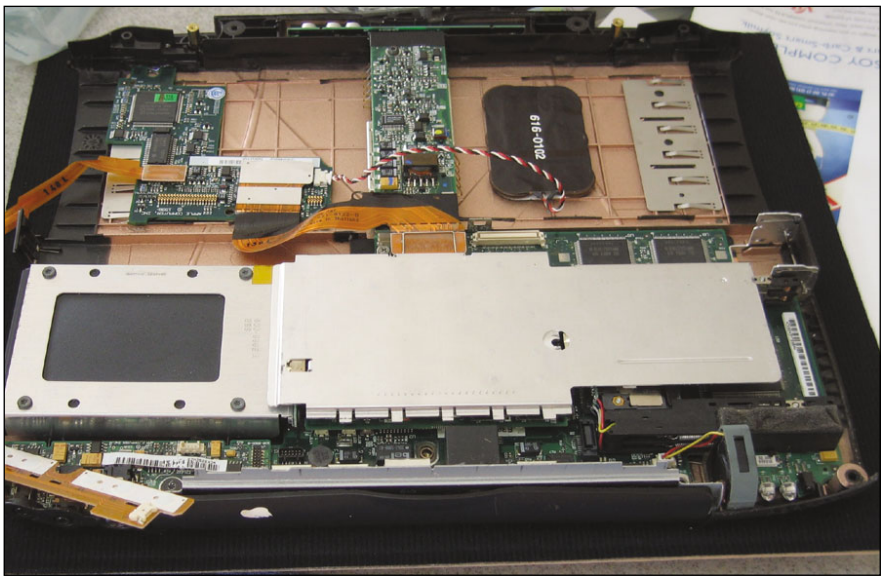
I bought my shadow box frame at a local art supplies store. The store had two versions: ugly and uglier. I bought the ugly one. With help from my crafty wife, we painted it a more pleasant color. If you remember anything from high school wood shop class, you might want to build your own frame instead of buying one. You'll also need a method for mounting components inside the frame. A hot-glue gun works wonders. Finally, a photo mat that fits inside the frame will give the project a finished look.

In selecting the laptop, the display is the most important feature. The notebook doesn't need a powerful CPU, but it should have a bright, backlit screen. A color screen isn't absolutely necessary, as you can use a grayscale screen for beautiful black-and-white images.

Prep The Software

It's a good idea to set up the software you will use before you actually take the laptop apart. You'll need a graphics viewer application with a full-screen slideshow mode. When the computer boots, it should automatically run the viewer program and begin showing a directory of images in full-screen mode. For Mac OS 7 through 9, JPEGView 3.3.1 (free; www.mac.org/graphics/jpegview) does the

Here's the same old PowerBook, but now it's hidden inside a frame.



When building the frame, certain components had to go. Here the base of the laptop is shown with keyboard, CD-ROM drive, and other components removed.

job nicely. DOS and Windows (even Windows 3.1) machines can use software from CShow (shareware; www.cshowplace.com). For Linux, ZGV (free; www.svgalib.org/rus/zgv) is a good choice.

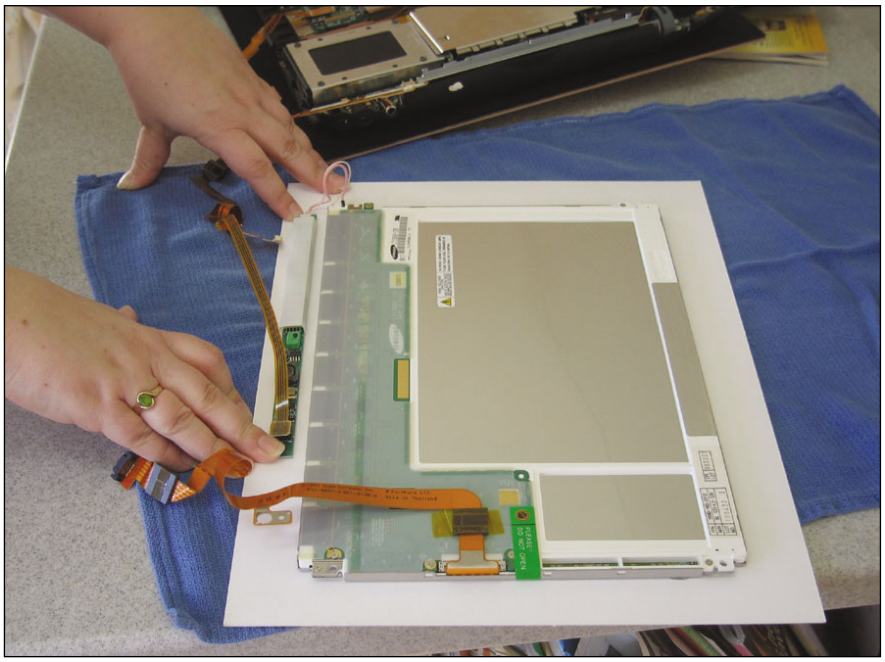
You'll also need a way to get new images into the machine after it's been built into the frame. There are several ways do this, and your choice will depend on the laptop's hardware and operating system. If the computer has an Ethernet jack, you can enable file sharing, and make sure to leave yourself easy access to the Ethernet port in your build. If the laptop has a PC Card slot, you can use a cheap wireless card to allow for access to your wireless LAN. This opens the possibility for interesting slideshows that use real-time information from the Internet, such as satellite weather or Web cam images, rather than a static set of pictures on the hard drive.

Aside from periodically adding new photos, I wanted my digital photo frame to look and act as a photograph, not just another computer that I would have to maintain. To do this you can use the preferences panel in whatever operating system you're using to make the laptop work as much as possible without your attention. I set up my laptop to require no user input as it boots (it won't, for instance, admonish me for not shutting it down properly after a power failure) and to use the Energy Save control panel to have the laptop automatically reboot after power is restored. I also used the control panel settings to leave the screen illuminated all the time but to spin down the hard drive after only one minute of inactivity.

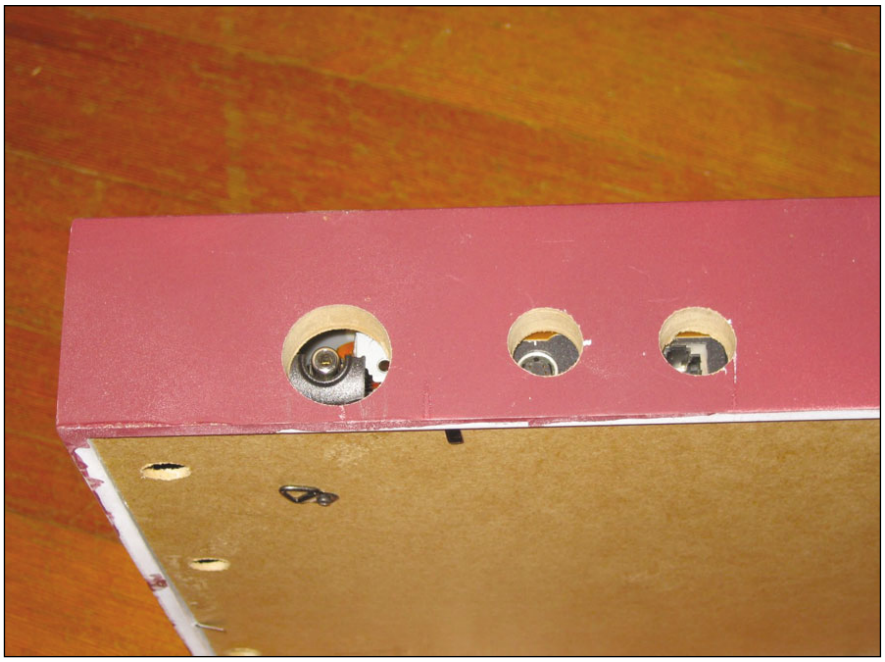
Build The Frame

Once the software is set up, start taking the computer apart. The goal is to remove the case and enough excess baggage so that you can fit the computer inside the frame. I started with the screen by first disconnecting it from the laptop's base section and then carefully removing the plastic case that surrounded the LCD. I also removed and tossed the speakers that had been mounted near the screen.

Next, I began working on the base, or the section that housed the CPU, hard drive, keyboard, and rest of the PowerBook's components. To squeeze the laptop into its new environs, I removed everything that wasn't absolutely necessary. The keyboard and touchpad were first to go, although the keyboard/mouse port remain so I can plug in external input devices when needed. The battery; CD drive; and other large, unnecessary components were next to go. If you need to, search the Web for disassembly instructions and service manuals for the laptop model you're victimizing. These can be very helpful for figuring out how



Assembling the digital frame required carefully centering and straightening the LCD on the photo mat before hot-gluing them together.



Holes hidden in the bottom of the frame provide access to the power, keyboard, and Ethernet ports, plus they allow routes for heat to escape.

to get the machine into pieces without killing it.

Depending on the laptop model and the size of the frame, you may have to re-orient the components so that they will fit in the space. Let the motherboard configuration dictate the position of the components. I removed the top of the base section (the plastic that surrounded the keyboard and touchpad) but left the motherboard installed on its plastic base for support. I then used Velcro and hot glue to affix the base section to the back of the frame.

Once I knew the exact position of the motherboard inside the frame, I used a half-inch drill bit to drill holes in the bottom of the frame for access to the power, keyboard, and Ethernet ports. These holes let me add pictures without opening the frame. I also drilled a few holes in the back of the frame to allow heat to escape. A piece of cardboard and small pieces of foam keep the motherboard isolated from the LCD.

The screen was the last component I placed. After carefully aligning it with the edges of the cardboard mat, I hot glued the LCD to the inside of the mat. I inserted the mat and screen into the frame, reconnected the screen to the motherboard, and closed the frame. The project was complete.

Positioning The Frame

In your project you'll need to consider whether you want to primarily show vertical or horizontal pictures and then orient the frame accordingly. When you display horizontal images in a vertical screen or vice versa, black bars at the edges of the screen can ruin the illusion that it's a real photograph. I opted for horizontal images to show landscape photos that were taken on vacations.

A more industrious person might want to hang the completed frame on a wall, but this would mean hiding the power cord, which is another project entirely. It's easier to place the frame on a table with the cord nicely tucked away. You can use a standard kickstand-style frame to keep the frame upright. My frame seemed too heavy to balance on a little piece of cardboard, so I opted to use a pair of metal plate holders, which are strong enough to hold the weight.

In the months since I built my digital picture frame, the ever-changing images have brought smiles to those who pass by it. The next time a spare laptop finds its way into your life, consider building a frame for yourself or a friend. CPU

by Kevin Savetz